

REMARKS

The specification and claims 1, 9, 10 and 24 have been amended, and claims 12-13 and 20 have been cancelled without prejudice. No new matter has been added by virtue of the amendments. The amendments merely address matters of form (i.e. non-substantive amendments) and were requested in the Office Action. The term "about" has been deleted from claim 1. Claim 24 also was amended to correct a claim dependency and add an inadvertently omitted word.

Applicant also believes that the amendments may be properly entered at this time, i.e. after final rejection, because the amendments do not raise any new issues or require a new search, and they reduce issues for appeal. As mentioned, the amendments merely address formal matters and were requested in the Office Action. Also, claim 1 merely deleted the term "about". Entry of the amendments at this time is earnestly solicited.

It is believed that the amendments made herein obviate the objection to page 8 of the specification and claims 9 and 10 as noted at page 2 of the Office Action.

Applicant's claimed invention is directed to ceramic igniter devices that have a first conductive zone of relatively low resistance, a power enhancement zone of intermediate resistance, and a further hot or ignition zone of high resistance.

Applicant has surprisingly discovered that igniters of the invention can provide extremely fast time-to-ignition temperatures, include ignition times of less than 1.5 seconds, or even 1 second or less. This is demonstrated for instance by the results shown in Example 2 of the application.

Such results are clearly significant. Applicant's preferred rapid-ignition ceramic igniters can replace spark ignition systems where an extremely fast time-to-temperature is required, e.g. for an ignition source for instantaneous water heating systems, cooltops, and the like.

Additionally, Applicant has found that an excessive hot zone path length can compromise performance, particularly the time required to reach ignition temperature. Independent claim 1 recites that the hot zone path length is 2 cm.

In this regard, Applicants file herewith the Rule 132 Declaration of Dr. Taehwan Yu. The Declaration includes comparative test results, which show the importance of a restricted hot zone path length. See Table 1 at page 3 of the Declaration.

The sole outstanding rejection is of claims 1-23 under 35 U.S.C. 103 over Axelson (U.S. Patent 5,705,261) in view of Willkens (U.S. Patent 5,786,565). The rejection is traversed.

As discussed in Applicant's prior response, the Axelson patent recites a portion 14 that is described as being preferably omitted for ease of manufacture. See the cited Axelson patent at col. 4, lines 30-32. In the Examples of the Axelson patent, an intermediate zone is not described. Note the Axelson patent at column 5, lines 50-55, where an intermediate zone is not mentioned.

Indeed, the Axelson patent nowhere contemplates the effect and performance that can be provided by Applicant's claimed booster zone region, including the exceptionally fast time-to-ignition temperatures that are demonstrated in Example 2 of the application.

The Axelson patent also does not mention lengths of a hot zone or an intermediate zone. The Axelson patent also shows a hairpin or "slotted" igniter that does not contain an interposed heat sink zone.

Thus, the Axelson patent does not disclose the hot zone path length, or the significance thereof, as Applicant discloses and claims. Nor does the Axelson patent mention the booster zone path lengths as recited in Applicant's claims 21-22, or an interposing heat sink zone (i.e. a "slotless" construction) as recited in Applicant's claims 23-24.

The addition of the Willkens patent does not sustain the rejection.

At page 3 of the Office Action, the following is stated:

The claims differ from the [Axelson patent] in calling for the hot zone length to be 2 cm or less. However, Willkens teaches forming the hot zone such that it is less than 0.5 cm. See abstract. By providing hot zones of relatively short length, isolated temperature gradients are avoided that can cause premature failure. In view of Willkens, it would have been obvious to one of ordinary skill in the art to provide a hot zone length (i.e., 2 cm or less) for the hot zone igniter in Axelson so that isolated temperature gradients are avoided that could cause premature failure.

Applicant respectfully disagrees with such basis for rejection.

Among other things, the cited disclosure of the Willkens patent is to an igniter where the hot zone directly adjoins cold, conductive zones and a heat sink zone.

In contrast, as mentioned above, the Axelson patent also shows a hairpin or "slotted" igniter that does not contain an interposed heat sink zone.

It is not seen that a skilled worker would have had any particular incentive to select a single feature (hot zone length) of the cited igniter of the Willkens patent with a heat sink zone and insert that selected aspect into a distinct igniter that does not contain an interposed heat sink zone.

Indeed, the cited Willkens patent notes the importance of the heat sink zone at column 3, lines 30-35, which reads as follows:

Without wishing to be tied to a theory, it is believed the added thermal mass of the heat sink significantly slows convective cooling of the hot zone, thereby allowing the hot zone to remain hot under convective cooling conditions despite its small size.

This further indicates that the skilled worker would not have inserted a feature of that Willkens system into another system that did not report use of a heat sink.

Moreover, Applicant's claim 1 calls for a hot zone path length 2 cm or less.

Still further, as mentioned above, submitted herewith is the Rule 132 Declaration of Dr. Taehwan Yu. This Declaration provides comparative data showing the performance benefits realized with igniters having a booster zone and hot zone length as claimed by Applicant.

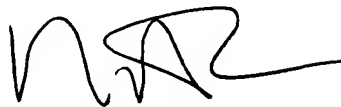
None of the cited documents disclose or otherwise suggest such a hot zone length in combination with a booster zone, or the benefits such hot zone lengths provide, as shown by the data in the Rule 132 Declaration.

In view thereof, reconsideration and withdrawal of the rejection is requested.

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

C. Willkens
U.S.S.N. 10/090,468
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Respectfully submitted,

A handwritten signature in black ink, appearing to be 'P. Corless', with a stylized, flowing script.

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